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RESPONSE UNDER 37 C.F.R. § 1.116
EXPEDITE PROCESSING
GROUP ART UNIT: 1731

PATENT

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Ljudmila Grigorievna ASLANOVA
Serial No. : 09/314,001 Art Unit : 1731
Filed : May 19, 1999 Examiner : J. Hoffman
For : METHOD AND APPARATUS FOR PRODUCING BASALTIC FIBERS

RESPONSE TO FINAL OFFICE ACTION

ATTN: BOX AF
Assistant Commissioner for Patents
Washington, DC 20231

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Sir :

Reconsideration of the Office Action of January 5, 2001 is respectfully requested. Enclosed herewith is a One Month Petition for Extension of Time together with the required fee.

In the Office Action, the drawings were indicated as being objectionable for not showing every feature of the invention specified in the claims. Reference is made in the Office Action to the stabilization occurring in the stabilizing section 6 to create a smooth and even surface, but that the drawings show that the glass has a smooth and even surface prior to stabilizing section 6. Accompanying this Office Action is a proposed Drawing Amendment which presents the glass upper surface in less schematic fashion than the original drawing and in conformance with the original written description (e.g., page 4, lines 24 and 25 and page 6, lines 6 and 7), which describes the

stabilization of the glass mass volume with respect to the expelling of foam and bubbles. As the original disclosure provides full support for the proposed drawing changes, it is respectfully submitted that no new matter has been introduced with these changes.

In the Office action, claims 1-7 and 19 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. For the reasons set out below, this objection is respectfully traversed.

Claim 19 is indicated in the Office Action as being considered indefinite on the basis of there being considered no indication of what the corresponding structure is that performs the means of claim 19. It is respectfully submitted that, with respect to claim 19, one of ordinary skill in the art, following a review of original disclosure, would understand the relationship between the means phrases set forth in that claim and the corresponding structure for such means set forth in the disclosure.

For illustrative purposes, provided below is claim 19 with added exemplifying reference numbers depicting structure which is representative of the means-plus-function phrases in claim 19:

An apparatus for the practice of producing basalt fibers of claim 1, comprising of:
means for preheating basalt (3);
means for introducing (1) the preheated basalt into a melting furnace (5);
means for heating (7) the basalt in said furnace to form a glass mass;
means for stabilizing glass mass volume (structural)

and relative relationship of section (6) with respect to furnace (5) and feeder means (8)) in a stabilizing section of the melting furnace;

until it reaches a fiber manufacturing temperature;
feeder means (8);

means for introducing the stabilized glass mass into said feeder means (inlet opening of feeder means 8);

means for stabilizing constituents of the glass mass (structure and relative relationship of glass melt holding area of the feeder means (8) in said feeder means to obtain a glass

mass having the composition

$$\frac{Al_2O_3 + SiO_2}{CaO + MgO} \geq 3 \quad \frac{FeO}{Fe_2O_3} \geq 0.5$$

$$\frac{2Al_2O_3 + SiO_2}{2Fe_2O_3 + FeO + CaO + MgO + K_2O + Na_2O} > 0.5$$

means for forming fibers (9, 10, 11) by pulling the further stabilized glass mass from spinneret means (11) which receive glass from the said feeder means.

From the above illustration concerning claim 19, and with reference to the original disclosure (e.g., detailed disclosure on page 5 and 6) and the drawings, it is respectfully submitted that the original disclosure does sufficiently describe to one of ordinary skill in the art what constitutes the means-plus-function features set out in claim 19. In view of this, it is respectfully submitted that claim 19 is in compliance with 35 U.S.C. § 112.

Claim 1 is indicated in the Office Action as being considered indefinite on the stated basis that the phrase "stabilizing the glass mass volume" is unclear. The phrase "stabilizing the glass mass volume" is respectfully submitted by Applicant to be definite

and in accordance with 35 U.S.C. § 112, on the basis that it clearly conveys the claimed feature of the nature of the glass mass volume in that foam and bubbles change the volume of the melt until the foam and bubbles are expelled sufficiently, wherein the melt stops changing in volume and thus becomes stable in volume.

Reference is made in the Office Action to the top of page 5 suggesting only the possibility of gas and exit foam. The reference disclosure on page 5 in the Office Action represents the letter portion of the following discussion bridging pages 4 and 5:

The stabilizing section which has a height of 0.4-.06 of the height of the furnace interior space contributes to stabilizing the melt in volume at the furnace exit with a specified temperature. The stabilizing section height is determined by the melt height as the temperature decreases, and the possible exit of gases and foam.

Thus, the letter phrase underlined above should be taken in context with the discussion concerning preferred stabilizing section height determination based on various characteristics of the system including the characteristics of expelled gases and foam. With this interpretation, there is no inconsistency or indefiniteness associated with the wording of the claims.

As for the phrase "stabilizing constituents" appearing in claim 1, this too is respectfully submitted to be definite as presented in claim 1. That is, it is respectfully submitted that in the context of the present invention, one of ordinary skill in the art would consider the term stabilizing constituents used in claim 1 definite. As described

in the specification on page 5, lines 15-17.

The stabilization section 6 of the melting furnace is connected to a feeder where the melt becomes stable [till] by way of averaging the mass and ensuring the relation of constituents in the composition... .

And, as described on page 6, lines 8-10 "a partially stabilized melt of glass mass enters the feeder 8 for averaging and obtaining the composition necessary for fiber manufacture... ."

Thus, one of ordinary skill in the art would understand the phrase "stabilizing constituents" to be definite as it appears in claim 1 in its indication that the glass mass is stabilized in the feeder for averaging the composition of glass mass to obtain the relation of the basic constituents. In other words, basalt rock has very non-uniform composition through volume even upon volume stabilization. For the high quality fiber it is necessary to make the composition more uniform (to homogenize it). The arrangement of the present invention thus feature a feeder constituent stabilization step involving a process of stabilizing the glass mass in averaging the composition so as to render the composition more uniform through mass (volume) by means of a diffusion process.

Thus, as set forth in claim 1, in combination with other indicated steps, preheated basalt is introduced into a melting furnace wherein it is heated to form a glass mass. The glass mass volume is then volume stabilized in a glass mass volume

stabilizing section of the melting furnace until it reaches a fiber manufacturing temperature and it is then introduced into a feeder in communication with the furnace. The method further involves stabilizing constituents of the glass mass in the feeder to obtain the desired glass mass composition ranges set forth in claim 1, wherein fiber formation is carried out.

As each claimed step of claim 1 is submitted to be definite, claim 1 is respectfully submitted to be in full compliance with 35 U.S.C. § 112, second paragraph.

In the Office Action, claim 19 is rejected under 35 U.S.C. § 112, first paragraph, as failing to provide support for the means plus function language. Thus rejection is respectfully traversed. As described above, in the response to the indefiniteness rejection, the original disclosure of the present application clearly describes the preferred steps involved in producing the advantageous fiber of the present invention, the preferred structure for producing each step and the function of the preferred structure for each step of the process. Accordingly, it is respectfully submitted that the disclosure shows that the Applicants were in full possession of the currently claimed invention in claim 19 as of the original filing date. In addition, as the structural features in the non means-plus-function claims of the present invention (e.g., claim 1) would be entitled to a complete range of equivalents in accordance with the applicable law, one of ordinary skill in the art would consider the Applicants, as of the time of the original application, to be in full possession of any equivalents associated with the means-plus-function

equivalents under 35 U.S.C. § 112, sixth paragraph.

Claims 1-7 and 19 stand rejected in the Office Action as being unpatentable over Austin, in view of Shofner and Naber.

In the rejection of the claims under the prior art, it is recognized that Austin does not go into detail as to how its melt is created. Reliance is placed on Austin on the basis that the ratios in claim 1 concerning the relative ratios "are inherently met by at least one of the specific compositions disclosed by Austin" by the referenced disclosure in Austin Column 2, line 48 - Column 3, line 17.

Naber is asserted in the Office Action as teaching that it is desirable to preheat basalt when making fibers, while Shofner is said to teach using a furnace (12) and a forehearth (18) to produce fibers from Basalt. It is indicated in the Office Action that it would have been obvious to use the Shofner apparatus to form the fibers described in Austin, and the Naber reference to preheat the basalt in the combination of Austin and Shofner.

In the "response to arguments" section of the Office Action, there is indicated that the claim feature of melt becoming stabilized in the stabilizing section of the melt furnace is not given weight because there is no explicit requirement in the claims and that there is reference to the disclosure of the stabilization being merely possible and that it is clear from the drawings that there is no foam in the stabilization section 16.

These rejections under 35 U.S.C. § 103 are respectfully traversed. The

indication that one of Austin's specific compositions renders inherent the ratios set forth in claim 1 as to the constituent stabilized melt in the filler section of the present invention is respectfully traversed. In Austin, the references Table 2 shows the percentage of different oxides in raw basalts, which then are melted (column 2, line 66). Applicant notes that the percentage of raw oxides is not directly indicative of a similar percentage in the basalt melt in the feeder, which feeds the fiber formation means. This is due to a variety of features and changes that raw basalt goes through in going from an original raw material through a melt within the furnace environment and then downstream to, in the present case, both a volume stabilization section of that furnace and a constituent stabilizing filler section. An example of some of the significant deviations that occur can be seen in the discussion in Austin as to the percentage shifts in the ratio to ferric oxides to ferrous oxide in column 1, lines 50 to 62, due to the furnace atmospheric condition. Accordingly, it is respectfully submitted that a prime facie case of obviousness has not been establish in the reference of Austin and the other reference of record fail to disclose or suggest the claimed relationship of claim 1. (Note also the indication of "(Na₂)" in Table 2 of Austin.)

As to Shofner, a review of the arrangement of Shofner reveals that it fails to provide sufficient disclosure to establish prima facie evidence of a step of volume stabilization succeeded by constituent stabilization in a feeder. That is, there is lacking any disclosure of suggestions of a volume stabilization step or area in furnace 12 suited

for such a step and instead, from a review of the melting furnace 12 and the relative arrangement of the feed layer across the melt, Shofner suggests no concern for stabilization prior to exiting into the forehearth. Also, the reliance placed on the upstream end of the feeder (18) is Shofner as rendering obvious the volume stabilization step in the stabilizing section of the furnace and the constituent subsequent stabilization in the feeder is respectfully submitted to be in error in that it represents a double usage of the filler (18) of Shofner as both a volume stabilization section and the filler itself.

As Naber fails to remedy the above-noted deficiencies with respect to Shofner and Austin, et al, it is respectfully submitted that the rejection based on the combination of Austin, Shofner and Naber fails to represent a prima facie case of obviousness against independent claim 1 and 19 of the present application.

In addition, it is respectfully submitted that the dependent claims even further distinguish the claimed invention over the prior art. For example, reference is made to claims such as claims 3 to 5, which describe in the context of the other claim features and claimed relationships, temperature ranges that work in conjunction with the ratios of claim 1 to provide desirable characteristics in the glass melt. The indication of obviousness to optimize the temperature in the asserted combination of references is respectfully submitted to be unsupported in the reliance on the references utilized.

Accordingly, in view of the above amendments and Remarks, Applicant respectfully submits that all of the claims are allowable, and that this application is

therefore in condition for allowance. Favorable Action is courteously requested at the Examiner's earliest convenience.

If any fees are due in connection with the filing of this Amendment or any papers that accompany it, such as fees under 37 C.F.R. §§ 1.16 or 1.17, please charge the fees to our Deposit Account No. 02-4300. If an extension of time under 37 C.F.R. § 1.136 is necessary that is not accounted for in the papers filed herewith, such an extension is requested. The extension fee also should be charged to Deposit Account No. 02-4300.

If for any reason a telephone discussion would facilitate the prosecution of this case to allowance, the Examiner is invited to telephone the undersigned to discuss the case.

Respectfully submitted,

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